driving circuit, comprising: a driving device connecting a reference potential point connected to an output terminal ; and

a power distributing circuit inserted between the reference potential point and the driving device.

49. (AS ONCE AMENDED) A plasma display apparatus having a capacitive-load driving circuit, comprising:

a plurality of driving devices driving a plurality of capacitive loads and formed in integrated-circuit form ; and

a power distributing circuit connecting each of the driving devices to a driving power supply source or a reference potential point .

53. (AS ONCE AMENDED) A plasma display apparatus having a capacitive-load driving circuit, comprising:

a driving device connecting a driving power supply source to an output terminal ; and

the driving power supply source selectively outputs a plurality of different voltage levels .

57. (AS ONCE AMENDED) A plasma display apparatus having a capacitive-load driving circuit, comprising:

a driving device driving a capacitive load connected to an output terminal, wherein

the capacitive-load driving circuit comprises a resistive impedance inserted in series to the output terminal.

REMARKS

In accordance with the foregoing, the specification and claims have been amended to improve form and without the introduction of new matter.

Approval and entry of the Amended specification paragraphs and amended claims are respectfully requested.

RESPONSE TO RESTRICTION REQUIREMENT

Applicants elect invention I and claims 1-40, without traverse.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

STAAS & HALSEY LLP

Date: March 10, 2003

By: _____

H. J. Staas
Registration No. 22,010

700 Eleventh Street, NW, Suite 500
Washington, D.C. 20001
(202) 434-1500

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

Please AMEND the paragraph beginning at page 10, line 15, as follows:

The following description deals primarily with the address driving circuit (address drive IC) of the plasma display apparatus, but it will be recognized that the capacitive-load driving circuit of the invention can be applied not only for the address driving circuit of the plasma display apparatus, but also for other circuits for driving [the] capacitive loads (e.g., discharge cells), such as the X driving circuit and the Y driving circuit; furthermore, the circuit technique of the invention can be applied extensively to circuits for driving various capacitive loads other than those in [the] a plasma display apparatus, for example, to circuits for driving logic gates formed from MOS transistors (the gate of each transistor to be driven can be considered a capacitor, with which a capacitor or the like, parasitic on an interconnection, etc., is combined to form a capacitive load).

Please AMEND the paragraph beginning at page 15, line 23, as follows:

In this way, according to the present invention, the power consumed in the address drive IC (capacitive-load driving circuit) 3 can be reduced. That is, though the power consumption as a whole remains the same, a portion of the power that would have been consumed in the address drive IC 3 in the prior art is consumed by the power distributing means 2; this construction serves to simplify the heat sinking structure of the address drive IC 3, and achieves a reduction in circuit cost.

Please AMEND the paragraph beginning at page 16, line 18, as follows:

Figure 4 is a block diagram showing a first embodiment of the capacitive-load driving circuit according to the present invention. In Figure 4, reference numeral 1 is a driving power supply source, 21 is a power distributing means, or circuit, 3 is an address drive IC, 4 is a reference potential point (ground point), 5 is a load capacitor, 6 and 7 are driving devices, 8 and 9 are a power supply terminal and a reference potential terminal (ground terminal), respectively, of the address drive IC, and 10 is an output terminal of the address drive IC.

Please AMEND the paragraph beginning at page 16, line 29, as follows:

As shown in Figure 4, in the first embodiment, the power distributing means, or circuit, 21 is inserted between the driving power supply source 1 and the high-level voltage supply terminal 8 of the address drive IC 3; this power distributing means is constructed as a resistive impedance (resistive element) 21 whose value is higher than about one-tenth of the resistive impedance that the driving device 6 provides at the time of conduction (the resistive component of the conducting impedance). According to the first embodiment, the power consumption of the driving circuit 3 can be reduced by distributing to the resistive element 21 about one-tenth or more of the power consumed in the driving device 6 during load driving.

Please AMEND the paragraph beginning at page 37, line 20, as follows:

As shown in Figure 27, [in] the 17th embodiment, the present invention is applied to the address drive IC 3 for driving, for example, the number, d, address lines (A1 to Ad) in a plasma display apparatus, and the drive IC itself is identical in configuration to that shown in Figure 15. That is, the drive IC 3 employs a CMOS configuration using pMOS transistors for pullup-side driving devices 60-1 to 60-d and nMOS transistors for pulldown-side driving devices 70-1 to 70-d, and the pullup- and pulldown-side driving devices are driven from the driving stages 600 and 700, respectively.

IN THE CLAIMS:

Please AMEND the following claims:

1. (ONCE AMENDED) A capacitive-load driving circuit, comprising: [including a configuration in which]

a driving device connecting a driving power supply source [is connected] to an output terminal [via a driving device, comprising] connectable to a capacitive load; and

a power distributing circuit [inserted] connected between the driving power supply source and the driving device.

2. (AS UNAMENDED) The capacitive-load driving circuit as claimed in claim 1, wherein the power distributing circuit is a resistive element having an impedance whose value is not smaller than one-tenth of the value of a resistive component of the conducting impedance

of the driving device.

3. (AS UNAMENDED) The capacitive-load driving circuit as claimed in claim 2, wherein the power distributing circuit is a high-power resistor having a capability to handle power higher than the allowable power of the driving device.

4. (AS UNAMENDED) The capacitive-load driving circuit as claimed in claim 1, wherein the power distributing circuit is a constant-current source.

5. (AS UNAMENDED) The capacitive-load driving circuit as claimed in claim 1, wherein the driving power supply source outputs a plurality of different voltage levels in a selective manner.

6. (AS UNAMENDED) The capacitive-load driving circuit as claimed in claim 5, wherein the power distributing circuit includes a plurality of power distributing units, one for each of the plurality of different voltage levels.

7. (AS UNAMENDED) The capacitive-load driving circuit as claimed in claim 6, wherein each of the power distributing units has a function as a switch for selecting one of the plurality of different voltage levels.

8. (AS UNAMENDED) The capacitive-load driving circuit as claimed in claim 1, wherein the driving device is a device whose input withstand voltage is higher than an output voltage.

9. (ONCE AMENDED) A capacitive-load driving circuit, comprising:

[including a configuration in which] a driving device connecting a reference potential point [is connected] to an output terminal [via a driving device, comprising] ; and

a power distributing circuit inserted between the reference potential point and the driving device.

10. (AS UNAMENDED) The capacitive-load driving circuit as claimed in claim 9, wherein the power distributing circuit is a resistive element having an impedance whose value is

not smaller than one-tenth of the value of a resistive component of the conducting impedance of the driving device.

11. (AS UNAMENDED) The capacitive-load driving circuit as claimed in claim 10, wherein the power distributing circuit is a high-power resistor having a capability to handle power higher than the allowable power of the driving device.

12. (AS UNAMENDED) The capacitive-load driving circuit as claimed in claim 9, wherein the power distributing circuit is a constant-current source.

13. (AS UNAMENDED) The capacitive-load driving circuit as claimed in claim 9, wherein the driving power supply source outputs a plurality of different voltage levels in a selective manner.

14. (AS UNAMENDED) The capacitive-load driving circuit as claimed in claim 13, wherein the power distributing circuit includes a plurality of power distributing units, one for each of the plurality of different voltage levels.

15. (AS UNAMENDED) The capacitive-load driving circuit as claimed in claim 14, wherein each of the power distributing units has a function as a switch for selecting one of the plurality of different voltage levels.

16. (AS UNAMENDED) The capacitive-load driving circuit as claimed in claim 9, wherein the driving device is a device whose input withstand voltage is higher than an output voltage.

17. (ONCE AMENDED) A capacitive-load driving circuit, comprising: [including a configuration in which]

a plurality of driving devices [for] driving a plurality of capacitive loads [are] and formed in integrated-circuit form[, wherein] ; and

a power distributing circuit connecting each of the plurality of driving devices [is connected] to a driving power supply source or to a reference potential point [via a power distributing circuit].

18. (AS UNAMENDED) The capacitive-load driving circuit as claimed in claim 17, further comprising a diode inserted between each of the capacitive loads and a corresponding one of the driving devices.

19. (AS UNAMENDED) The capacitive-load driving circuit as claimed in claim 17, wherein each of the power distributing circuit is a resistive element having an impedance whose value is not smaller than one-tenth of the conducting impedance of the driving device divided by the number of driving devices connected to the power distributing circuit.

20. (AS UNAMENDED) The capacitive-load driving circuit as claimed in claim 19, wherein each of the power distributing circuit is a high-power resistor having a capability to handle power higher than the allowable power of the driving device.

21. (AS UNAMENDED) The capacitive-load driving circuit as claimed in claim 17, wherein each of the power distributing circuit is a constant-current source.

22. (AS UNAMENDED) The capacitive-load driving circuit as claimed in claim 17, wherein the driving power supply source outputs a plurality of different voltage levels in a selective manner.

23. (AS UNAMENDED) The capacitive-load driving circuit as claimed in claim 22, wherein the power distributing circuit includes a plurality of power distributing units, one for each of the plurality of different voltage levels.

24. (AS UNAMENDED) The capacitive-load driving circuit as claimed in claim 23, wherein each of the power distributing units has a function as a switch for selecting one of the plurality of different voltage levels.

25. (AS UNAMENDED) The capacitive-load driving circuit as claimed in claim 17, wherein the driving device is a device whose input withstand voltage is higher than an output voltage.

26. (AS UNAMENDED) The capacitive-load driving circuit as claimed in claim 17, wherein a ground terminal of each of the integrated driving devices is connected to the driving power supply source via the power distributing circuit.

27. (AS UNAMENDED) The capacitive-load driving circuit as claimed in claim 17, wherein a ground terminal of each of the integrated driving devices is connected to the reference potential point via the power distributing circuit.

28. (AS UNAMENDED) The capacitive-load driving circuit as claimed in claim 17, wherein a series connection of each of the power distributing circuit and a switch device is provided between each of the driving devices and the driving power supply source or the reference potential point.

29. (AS UNAMENDED) The capacitive-load driving circuit as claimed in claim 17, wherein the capacitive-load driving circuit is constructed as a driving module containing a plurality of driving integrated circuits for driving the capacitive loads.

30. (AS UNAMENDED) The capacitive-load driving circuit as claimed in claim 29, wherein each of the driving integrated circuits comprises a high-voltage output device whose input withstand voltage is increased up to a driving power supply voltage, and a flip-flop that drives a control input of the output device to a full-swing level either at the driving power supply voltage or at the reference potential.

31. (AS UNAMENDED) The capacitive-load driving circuit as claimed in claim 29, wherein each of the driving integrated circuits includes a buffer driven by a logic voltage, and wherein an output of the buffer is connected to an input terminal of the each driving device, and the power distributing circuit to an inverting input terminal of the each driving device, thereby applying self-biasing to the driving device by a voltage drop occurring across the power distributing circuit.

32. (AS UNAMENDED) The capacitive-load driving circuit as claimed in claim 29, further comprising a switch device inserted between the power distributing circuit and the driving power supply source or the reference potential point, and the switch being caused to

conduct after the driving devices have been switched into a conducting state.

33. (AS UNAMENDED) A capacitive-load driving circuit including a configuration in which a driving power supply source is connected to an output terminal via a driving device, wherein the driving power supply source outputs a plurality of different voltage levels in a selective manner.

34. (AS UNAMENDED) The capacitive-load driving circuit as claimed in claim 33, wherein the driving power supply source raises or lowers an output voltage in steps by switching the output voltage between the plurality of voltage levels within a drive voltage amplitude, while retaining ON/OFF states of the driving device.

35. (AS UNAMENDED) A capacitive-load driving circuit for driving a capacitive load, connected to an output terminal, by a driving device, comprising a resistive impedance inserted in series to the output terminal.

36. (AS UNAMENDED) The capacitive-load driving circuit as claimed in claim 35, wherein the resistive impedance provides an impedance whose value is not smaller than one-tenth of the value of a resistive component of the conducting impedance of at least one of the driving devices.

37. (AS UNAMENDED) The capacitive-load driving circuit as claimed in claim 35, wherein the resistive impedance is a distributed resistor showing a resistance value not smaller than three-tenths of the value of a resistive component of the conducting impedance of at least one of the driving devices.

38. (AS UNAMENDED) The capacitive-load driving circuit as claimed in claim 35, further comprising:

a driving power supply source connected to the output terminal via the driving device; and

a power distributing circuit inserted between the driving power supply source and the driving device.

39. (AS UNAMENDED) The capacitive-load driving circuit as claimed in claim 35, further comprising:

a reference potential point connected to the output terminal via the driving device; and

a power distributing circuit inserted between the reference potential point and the driving device.

40. (AS UNAMENDED) The capacitive-load driving circuit as claimed in claim 35, further comprising a plurality of driving devices, for driving a plurality of capacitive loads, formed in integrated-circuit form, wherein each of the driving devices is connected to a driving power supply source or a reference potential point via a power distributing circuit.

41. (ONCE AMENDED) A plasma display apparatus having [an electrode driving circuit using] a capacitive-load driving circuit, comprising: [wherein the capacitive-load driving circuit including a configuration in which]

a driving device connecting a driving power supply source [is connected] to an output terminal [via a driving device,] ; and [comprising]

a power distributing circuit [inserted] connected between the driving power supply source and the driving device.

42. (AS UNAMENDED) The plasma display apparatus as claimed in claim 41, wherein the capacitive-load driving circuit is used as a driving circuit for driving address electrodes.

43. (AS UNAMENDED) The plasma display apparatus as claimed in claim 42, wherein:

the plasma display apparatus is a three-electrode surface-discharge AC plasma display apparatus in which the address electrodes are formed on a first substrate and X and Y electrodes are formed on a second substrate; and

thickness of a conductive layer of each of the address electrodes is reduced to one half or less of the thickness of a conductive layer formed from the same material as the conductive layer of each of the X and Y electrodes.

44. (AS UNAMENDED) The plasma display apparatus as claimed in claim 42,

wherein:

the plasma display apparatus is a three-electrode surface-discharge AC plasma display apparatus in which the address electrodes are formed on a first substrate and X and Y electrodes are formed on a second substrate; and

each of the address electrodes is formed from a plurality of conductive metal layers, and an arbitrary one of the conductive metal layers is omitted.

45. (ONCE AMENDED) A plasma display apparatus having [an electrode driving circuit using] a capacitive-load driving circuit, comprising: [wherein the capacitive-load driving circuit including a configuration in which] a driving device connecting a reference potential point [is] connected to an output terminal [via a driving device,] ; and [comprising]

a power distributing circuit inserted between the reference potential point and the driving device.

46. (AS UNAMENDED) The plasma display apparatus as claimed in claim 45, wherein the capacitive-load driving circuit is used as a driving circuit for driving address electrodes.

47. (AS UNAMENDED) The plasma display apparatus as claimed in claim 46, wherein:

the plasma display apparatus is a three-electrode surface-discharge AC plasma display apparatus in which the address electrodes are formed on a first substrate and X and Y electrodes are formed on a second substrate; and

thickness of a conductive layer of each of the address electrodes is reduced to one half or less of the thickness of a conductive layer formed from the same material as the conductive layer of each of the X and Y electrodes.

48. (AS UNAMENDED) The plasma display apparatus as claimed in claim 46, wherein:

the plasma display apparatus is a three-electrode surface-discharge AC plasma display apparatus in which the address electrodes are formed on a first substrate and X and Y electrodes are formed on a second substrate; and

each of the address electrodes is formed from a plurality of conductive metal layers, and

an arbitrary one of the conductive metal layers is omitted.

49. (ONCE AMENDED) A plasma display apparatus having [an electrode driving circuit using] a capacitive-load driving circuit, comprising: [wherein the capacitive-load driving circuit including a configuration in which]

a plurality of driving devices [for] driving a plurality of capacitive loads and [are] formed in integrated-circuit form[, wherein] ; and

a power distributing circuit connecting each of the driving devices [is connected] to a driving power supply source or a reference potential point [via a power distributing circuit].

50. (AS UNAMENDED) The plasma display apparatus as claimed in claim 49, wherein the capacitive-load driving circuit is used as a driving circuit for driving address electrodes.

51. (AS UNAMENDED) The plasma display apparatus as claimed in claim 50, wherein:

the plasma display apparatus is a three-electrode surface-discharge AC plasma display apparatus in which the address electrodes are formed on a first substrate and X and Y electrodes are formed on a second substrate; and

thickness of a conductive layer of each of the address electrodes is reduced to one half or less of the thickness of a conductive layer formed from the same material as the conductive layer of each of the X and Y electrodes.

52. (AS UNAMENDED) The plasma display apparatus as claimed in claim 50, wherein:

the plasma display apparatus is a three-electrode surface-discharge AC plasma display apparatus in which the address electrodes are formed on a first substrate and X and Y electrodes are formed on a second substrate; and

each of the address electrodes is formed from a plurality of conductive metal layers, and an arbitrary one of the conductive metal layers is omitted.

53. (ONCE AMENDED) A plasma display apparatus having [an electrode driving circuit using] a capacitive-load driving circuit, comprising: [wherein the capacitive-load driving

circuit including a configuration in which]

a driving device connecting a driving power supply source [is connected] to an output terminal [via a driving device, wherein] ; and

the driving power supply source selectively outputs a plurality of different voltage levels [in a selective manner].

54. (AS UNAMENDED) The plasma display apparatus as claimed in claim 53, wherein the capacitive-load driving circuit is used as a driving circuit for driving address electrodes.

55. (AS UNAMENDED) The plasma display apparatus as claimed in claim 54, wherein:

the plasma display apparatus is a three-electrode surface-discharge AC plasma display apparatus in which the address electrodes are formed on a first substrate and X and Y electrodes are formed on a second substrate; and

thickness of a conductive layer of each of the address electrodes is reduced to one half or less of the thickness of a conductive layer formed from the same material as the conductive layer of each of the X and Y electrodes.

56. (AS UNAMENDED) The plasma display apparatus as claimed in claim 54, wherein:

the plasma display apparatus is a three-electrode surface-discharge AC plasma display apparatus in which the address electrodes are formed on a first substrate and X and Y electrodes are formed on a second substrate; and

each of the address electrodes is formed from a plurality of conductive metal layers, and an arbitrary one of the conductive metal layers is omitted.

57. (ONCE AMENDED) A plasma display apparatus having [an electrode driving circuit using] a capacitive-load driving circuit, comprising: [for driving]

a driving device driving a capacitive load[,] connected to an output terminal[, by a driving device], wherein

the capacitive-load driving circuit comprises a resistive impedance inserted in series to the output terminal.

58. (AS UNAMENDED) The plasma display apparatus as claimed in claim 57, wherein the capacitive-load driving circuit is used as a driving circuit for driving address electrodes.

59. (AS UNAMENDED) The plasma display apparatus as claimed in claim 58, wherein:

the plasma display apparatus is a three-electrode surface-discharge AC plasma display apparatus in which the address electrodes are formed on a first substrate and X and Y electrodes are formed on a second substrate; and

thickness of a conductive layer of each of the address electrodes is reduced to one half or less of the thickness of a conductive layer formed from the same material as the conductive layer of each of the X and Y electrodes.

60. (AS UNAMENDED) The plasma display apparatus as claimed in claim 58, wherein:

the plasma display apparatus is a three-electrode surface-discharge AC plasma display apparatus in which the address electrodes are formed on a first substrate and X and Y electrodes are formed on a second substrate; and

each of the address electrodes is formed from a plurality of conductive metal layers, and an arbitrary one of the conductive metal layers is omitted.

61. (AS UNAMENDED) An inductance-load driving circuit for driving an inductive load, connected to an output terminal, by a driving device, wherein a resistive impedance is inserted in series to the output terminal.

62. (AS UNAMENDED) The inductive-load driving circuit as claimed in claim 61, wherein the resistive impedance provides an impedance whose value is not smaller than one-tenth of the value of a resistive component of the conducting impedance of at least one of the driving devices.